

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: §
Robert S. Lewandowski et al. § Confirmation No.: 8312
§
Application No.: 10/814,956 § Group Art Unit: 3662
§
Filed: March 31, 2004 § Examiner: Lobo, Ian J.
§
For: METHOD AND MEANS FOR § Atty. Docket: 126956-6/YOD/SIN
ISOLATING ELEMENTS OF A § GERD:0607
SENSOR ARRAY §

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37 C.F.R. 1.8

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/Patrick S. Yoder/

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REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41

Appellants submit this Reply Brief pursuant to 37 C.F.R. § 41.41 and in response to the Examiner's Answer mailed on April 17, 2009. Specifically, this Reply Brief highlights the underlying deficiencies of the contentions made by the Examiner in the Examiner's Answer with respect to the rejection of claims 12 and 39 under 35 U.S.C. § 112, second paragraph, as well as with respect to the rejection of claims 1-10, 12, 35-37, and 39 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,262,946 (hereinafter "Khuri-Yakub") in view of U.S. Patent 6,669,644 (hereinafter "Miller") and U.S. Patent 6,051,868 (hereinafter "Watanabe"). In the interest of brevity, Appellants have addressed below only those issues or arguments raised in the Examiner's Answer that are particularly noteworthy. Accordingly, in view of Appellants' attempt to avoid repetition in this Reply Brief, Appellants respectfully request that the Board consider the following remarks in addition to the complete arguments set forth in the Appeal Brief filed on February 19, 2008.

First Ground of Rejection

In the Examiner's Answer, the Examiner maintained that dependent claims 12 and 39 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter regarded as the invention. Appellants respectfully urge the Board to reverse this rejection in view of the reasons set forth in the Appeal Brief, and reiterated below.

In particular, in the Examiner's Answer, the Examiner stated that:

In response to appellants [sic] arguments directed to the 35 USC 112, second paragraph rejection, examiner disagrees that the rejection is based upon confusion between claim breath [sic] and indefiniteness. Although it is agreed that a patentee may be his/her own lexicographer, it is also well established that a dependent claim may not contradict a claim upon which it depends. In the instant case, the independent claims 1 and 35 specify that the barriers and their adjoining portions are "coated with a thin insulating material". Claims 12 and 39, which depend upon the independent claims, then specify that the trenches (barriers) are "coated with an electrically conductive material that is grounded". There is a clear contradiction between the dependent claims and the independent claims since coating with an electrically conductive layer is contradictory to coating with an insulating material. Based upon this, it is unclear how the dependent claims further limit the independent claims.

Examiner's Answer, pages 6-7.

However, as argued in the Appeal Brief, Appellants contend that dependent claims 12 and 39 are not indefinite because the terminology "electrically conductive material that is grounded to electrically isolate one sensor element from the next" recited in dependent claims 12 and 39 is disclosed in the specification with a reasonable degree of clarity and particularity. In particular, the specification clearly describes that *both* (1) the trenches and adjoining portions of the substrate may be coated with a thin layer of insulating material *and* (2) the surface of each of the trenches may be coated with an electrically conductive material that is grounded to electrically isolate one transducer element from the next, as generally recited by dependent claims 12 and 39. For example, the specification states that:

Alternatively, a primarily non-conductive substrate could be used for cMUT fabrication where the bottom electrode would be either deposited metal or

selectively doped regions under the cMUT. In this case, it may be desirable to ground the regions between each element by selectively doping these regions and electrically grounding them. *Another method of grounding the regions between elements that are separated with isolation trenches (as previously described) would be to coat a surface (e.g., the walls) of the trenches with an electrically conductive material, such as aluminum or an aluminum-silicon alloy, and then connect this metal to ground to electrically isolate one element from the next.* Either method would allow stray charges to be conducted to ground rather than to neighboring elements.

Specification, page 15, lines 6-16 (emphasis added).

Therefore, Appellants contend that the specification clearly states that regions between elements that are separated with isolation trenches may, *in addition*, be grounded by coating the surface of the trenches with an electrically conductive material and connecting this metal to ground. As such, *both* (1) the trenches and adjoining portions of the substrate may be coated with a thin layer of insulating material *and* (2) the surface of each of the trenches may be coated with an electrically conductive material that is grounded to electrically isolate one transducer element from the next, as generally recited by dependent claims 12 and 39. Appellants contend that there is nothing contradictory about coating the trenches and adjoining portions of the substrate with a thin layer of insulating material and, *in addition*, coating the surface of the trenches with within an electrically conductive material.

Accordingly, Appellants respectfully submit that dependent claims 12 and 39 are not unclear or indefinite and respectfully request reversal of the rejection of claims 12 and 39 under 35 U.S.C. § 112, second paragraph.

Second Ground of Rejection

In the Examiner's Answer, the Examiner maintained that claims 1-10, 12, 35-37, and 39 were rejected under 35 U.S.C. § 103(a) as unpatentable over Khuri-Yakub in view of Miller and Watanabe. Appellants respectfully urge the Board to reverse this rejection in view of the reasons set forth in the Appeal Brief, and reiterated below.

The Hypothetical Combination of Miller with Khuri-Yakub

In particular, in the Examiner's Answer, the Examiner stated:

It is pointed out that Appellant's arguments are primarily concerned with what the secondary references to Miller and Watanabe do not show rather than what they do disclose and teach. First, Appellant argues that a specific feature of independent claims 1 and 35 is omitted from Miller since Miller shows that the barriers or trenches extend completely through the substrate material whereas in the instant claims the barriers or trenches extend into the substrate material but not completely through the material. *This argument is not convincing since Appellant is arguing what Miller does not show and has failed to appreciate the reason that Miller was applied in the rejection and what Miller does show.*

Specifically, Miller is applied in the rejection for its teaching of the application of plural barriers or trenches. Whether the trenches or barriers extend completely through the substrate material or not completely through the substrate material is irrelevant because of Khuri-Yakub et al. Khuri-Yakub et al [sic] is applied in the rejection for disclosing (a) that the trench or barrier is used for lateral energy propagation elimination and, (b) that the trench or barrier does not extend completely through the substrate material. What is being gleaned from Miller and applied to Khuri-Yakub et al [sic] is merely the teaching of using plural trenches or barriers.

Examiner's Answer, pages 7-8 (emphasis added).

Therefore, the Examiner argues that Miller is relied upon for showing a multiplicity of barriers or trenches. However, as argued in the Appeal Brief, Appellants contend that Miller cannot be relied upon for disclosing a multiplicity of barriers or trenches because Miller does not, in fact, show a multiplicity of barriers or trenches. Rather, as depicted in FIGS. 2-5 of Miller, a multiplicity of *holes* (215, 315, 415, 515) are etched through the MUT substrate 220 proximate to each MUT cell 216. Appellants contend that the *holes* disclosed in Miller cannot reasonably be interpreted as barriers or trenches, as recited by independent claims 1 and 35.

In addition, Appellants further contend that the holes disclosed in Miller cannot be interpreted as barriers or trenches that *do not extend completely through the substrate material*. The Examiner appears to argue that the fact that Miller discloses holes that extend completely through the substrate material bears no weight in that the Examiner is not relying upon Miller for

disclosing this subject matter. However, Appellants argue that the fact that Miller discloses *holes* which extend *completely through* the substrate material is further evidence of the lack of the requisite motivation to combine Miller with Khuri-Yakub. In particular, Appellants contend that one skilled in the art would not be motivated to use a multiplicity of the channels 23 disclosed in FIG. 10 of Khuri-Yakub merely because Miller shows a multiplicity of *holes* through a substrate.

For at least these reasons, Appellants contend that the hypothetical combination of Miller with Khuri-Yakub fails to read on all the features of the claimed invention. In addition, Appellants contend that the Examiner has improperly combined Miller with Khuri-Yakub in an attempt to rely upon Miller for disclosing a plurality of barriers or trenches.

The Hypothetical Combination of Watanabe with Khuri-Yakub

In addition, in the Examiner's Answer, the Examiner stated that:

With respect to Watanabe, appellant argues that the use of insulating coatings within the barriers or trenches is for separating transistors or analog circuits which is unlike the separating of transducer arrays as disclosed in Khuri-Yakub et al. This argument is not convincing since both systems (transducer arrays and transistors) have the commonality of being arranged on a substrate material where the substrate material propagates crosstalk or lateral propagation which are interference phenomena that both systems look to eliminate. Thus, as much as appellant attempts to distinguish the systems of Khuri-Yakub et al [sic] and Watanabe, they still have a lot in common.

Examiner's Answer, page 8.

In the Final Office Action, the Examiner relied upon Watanabe solely for its disclosure of a semiconductor device wherein trenches are also coated with silicon oxide or silicon nitride (insulators) for reducing cross talk. However, Appellants reiterate that Watanabe relates to a semiconductor device, and more particularly relates to a semiconductor device comprising high-speed analog circuits connected to multiple-power supplies and specific structures capable of reducing cross talk originating in these analog circuits. Specifically, Watanabe discloses a

principle of operation wherein electrical potentials of high concentration n-type layers are stabilized at a fixed value by the supply of power through electrodes mounted on the layers in order to prevent cross talk. In complete contrast, Khuri-Yakub relates to capacitive micromachined ultrasonic transducers to minimize the excitation and propagation of plate waves and ultrasonic waves.

Moreover, Watanabe discloses the use of trenches to reduce crosstalk only in the context of *separating transistors*, unlike in the context of *separating transducer arrays* as disclosed in Khuri-Yakub. Appellants respectfully submit that it would be improper to modify the transducer-based system of Khuri-Yakub to include trenches coated with silicon oxide or silicon nitride (insulators), as disclosed in Watanabe, because such a modification would change the principle of operation of Khuri-Yakub. In fact, it would require a substantial redesign of Khuri-Yakub to incorporate trenches coated with silicon oxide or silicon nitride (insulators), and it would render the transducer-based system of Khuri-Yakub inoperable for its intended purpose. Therefore, even though the Examiner contends that Khuri-Yakub and Watanabe “have a lot in common,” Appellants still contend that one skilled in the art would not be motivated to combine Watanabe with Khuri-Yakub due, at least in part, to the contrasting principles of operation and intended purposes.

For at least these reasons, Appellants contend that the Examiner has improperly combined Watanabe with Khuri-Yakub.

As such, the cited references, taken alone or in hypothetical combination, fail to disclose all of the features of claims 1-10, 12, 35-37, and 39. Appellants, therefore, assert that claims 1-10, 12, 35-37, and 39 are allowable. Accordingly, Appellants respectfully request reversal of the rejection of claims 1-10, 12, 35-37, and 39 under 35 U.S.C. § 103(a) and further respectfully request that the Examiner pass all currently pending claims to allowance.

Conclusion

Appellants respectfully submit that all pending claims are in condition for allowance and urge the Board to reverse the outstanding rejections.

Respectfully submitted,

Date: June 15, 2009

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